SLC™ Programmable Controllers

EEPROM Memory Module – Catalog No. 1745-M1

The EEPROM Memory Module

The EEPROM is a non-volatile memory in convenient modular form, for use with SLC 100 and SLC 150 Programmable Controllers.

A Series B module or a Series A module having a 28-pin chip must be used with the SLC 150 processor unit. The majority of Series A modules sold in the past meet the 28-pin chip requirement.

Specifications

Memory Type:
Electrically-Erasable Programmable Read-Only Memory (EEPROM).

Memory Size: 1200 words maximum.

Ambient Temperature Range:
0° to 60° C (operating). – 40° to 85° C (storage).

EEPROM Program Identification

Since EEPROM modules can be inserted in any SLC 100 or SLC 150 processor unit, it is important that you identify each EEPROM with the particular program it contains and the controller or controllers it is to be used with.

Caution: Interchanging programs between controllers could cause improper operation and equipment damage. You must be especially cautious when interchanging programs between SLC 150 and SLC 100 controllers, because of differences associated with certain internal addresses and other variations.

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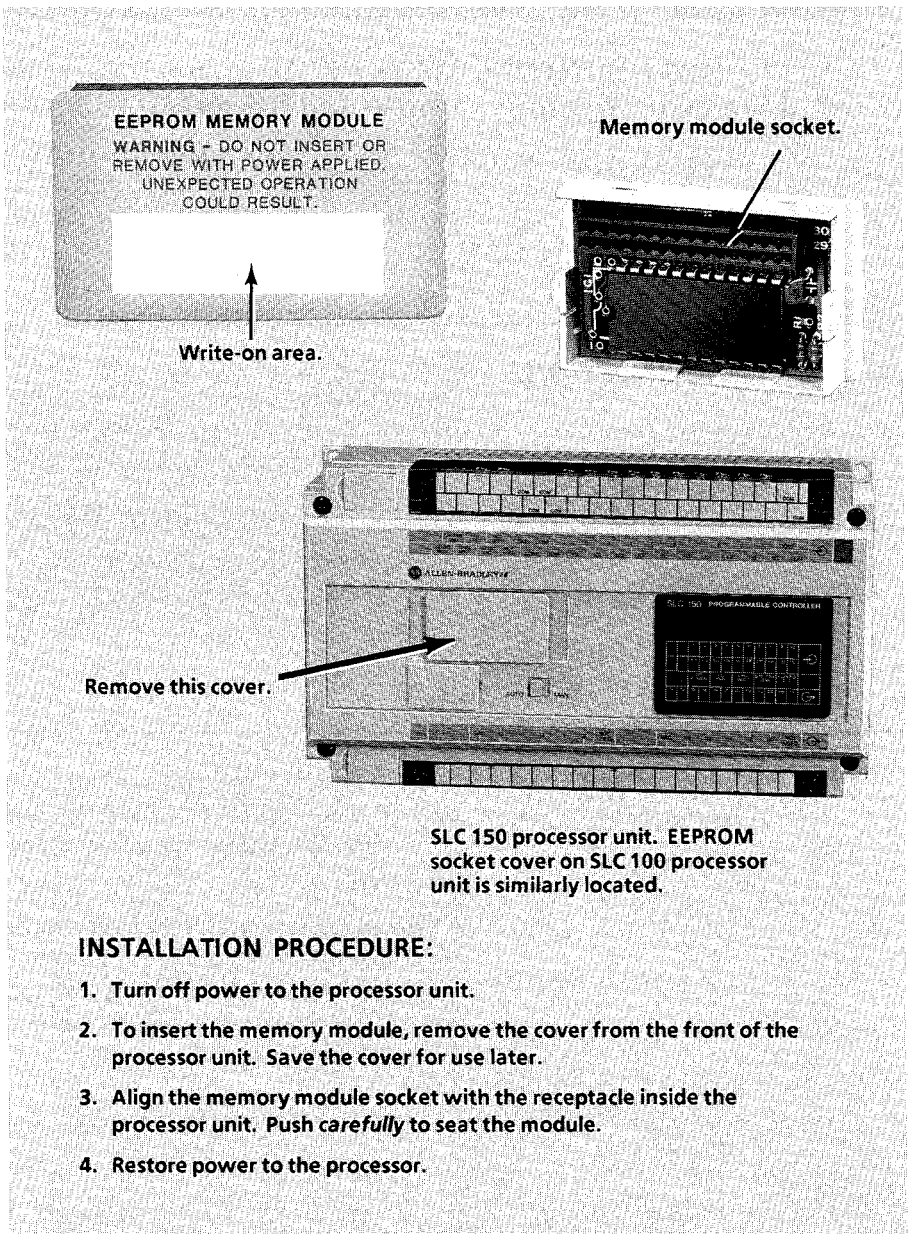
Installing the EEPROM

The procedure for installing the EEPROM in the processor unit is shown in the figure below. IMPORTANT: Always turn off power to the processor before you insert or remove the EEPROM. This guards against possible damage to the EEPROM and also avoids undesired CPU faults.


EEPROM MEMORY MODULE
WARNING - DO NOT INSERT OR REMOVE WITH POWER APPLIED. UNEXPECTED OPERATION COULD RESULT.
Write-on area.
Memory module socket.
Remove this cover.

SLC 150 processor unit. EEPROM socket cover on SLC 100 processor unit is similarly located.

INSTALLATION PROCEDURE:

1. **Turn off power to the processor unit.**
2. **To insert the memory module, remove the cover from the front of the processor unit. Save the cover for use later.**
3. **Align the memory module socket with the receptacle inside the processor unit. Push *carefully* to seat the module.**
4. **Restore power to the processor.**

Storing and Loading Procedures

The following paragraphs explain how to use the pocket programmer to store a processor RAM program in the EEPROM and to load an EEPROM program in the processor RAM. If you are using the personal computer software, refer to the SLC Personal Computer Software User's Manual (Pub. 1745-825) for further information on these procedures.

Storing a Program in the Memory Module

The following steps show you how to use the pocket programmer to store (save) the contents of the processor RAM in the EEPROM memory module. If you are using an access code, it will be stored in the EEPROM. We'll assume that the memory module is not plugged in.

1. Connect the programmer. Press MODE, 6, ENTER. Display will show **SurE ?**

   Note: You could press ENTER a second time, altho it isn't necessary. Error code E51 will appear; you can ignore the error code and perform step 2.
2. Disconnect power from the processor. Insert the memory module. Restore power.
3. Press ENTER, ENTER. After a brief time, the display will momentarily show **donE**. Any program previously stored in the memory module will be erased.
4. You can now disconnect power and remove the memory module (replace cover), or you can leave the module in place. The processor operates from the RAM only.

> **Caution:** It is important to enter mode 6 *before* installing the memory module. Reason: If the processor were in the Run mode when you disconnect power, insert the memory module, and restore power (step 2), your program could be *automatically erased* and replaced with the contents of the memory module. Refer to auto-load procedure on the following page.

Loading the EEPROM into the Processor RAM

The following steps show you how to use the pocket programmer to load (read) the contents of the EEPROM memory module into the processor RAM. If you know that the processor is in the Run mode, you may be able to use the auto-load procedure described on Page 4. If the processor is in some other mode, follow these steps:

1. Disconnect power from the processor. Insert the memory module. Restore power.
2. Connect the programmer. Press MODE, 7, ENTER, ENTER. (If an access code is stored in the EEPROM, you will be requested to enter the code after you press ENTER the second time.)
3. Duplication of the EEPROM contents in the RAM occurs almost instantaneously. The previous program in the RAM is automatically erased.
4. You can now disconnect power and remove the memory module (replace cover), or you can leave the module in place. The processor operates from the RAM only.

Auto-Load Procedure

If you are using an SLC 100 processor unit: The auto-load procedure will load the contents of an EEPROM into the processor RAM without the use of the programmer. The only exception: If the EEPROM has an access code, you must use the programmer. (It doesn't matter whether the processor has the same code as the EEPROM, a different code, or no code.)

Follow these steps:

1. The processor must be in the Run mode initially.
2. If the processor is energized, disconnect power. Insert the EEPROM. **Caution:** To avoid automatically entering the Run mode when you restore power, set the Auto/Man switch to Man at this time.
3. Restore power. The EEPROM contents is automatically duplicated in the RAM. The previous program in the RAM is automatically erased.
4. When you are certain it is safe to enter the Run mode, set the Auto/Man switch to Auto.

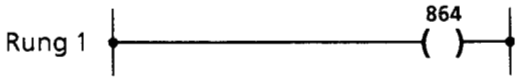
If you are using an SLC 150 processor unit: In this case, you can enter an access code in the processor RAM to protect the stored program against unauthorized EEPROM loading. The table below indicates the conditions under which the auto-load procedure will and will not function. If the auto-load is functional, follow steps 1 - 4 in the paragraph above.

SLC 150 Processor Unit	EEPROM Module	Auto-Load Functional?
Has access code	Has no access code or access code does not match code in processor	No. You must use programmer.
Has access code	Has same access code as the processor	Yes
Has no access code	May or may not have access code	Yes

Programmable Auto-Load – SLC 150 Processor Unit

With the SLC 150 processor unit, you can use address 864 in your program to automatically load the EEPROM program in the processor RAM when the processor detects a memory checksum error. Such errors are detected if memory data is altered or lost due to capacitor back-up drain, battery back-up drain, or processor malfunction. It works like this:

1. Enter the following unconditional rung as Rung 1 of your program:



2. Enter the rest of your program and store the program in the EEPROM. This is your "back-up" program.
3. If a memory problem occurs and the processor unit detects a memory error (codes 5 thru 8), recycle power. The EEPROM program will be automatically loaded in the processor RAM, clearing the error.

   An error 6 message will be displayed by the pocket programmer following an auto-load error. This error message can be cleared by using the Cancel key on the pocket programmer or re-entering the Run/Mon/Test mode via SLC personal computer software.

Important: Keep in mind that when the auto-load occurs, the I/O table data is cleared. All retentive instructions (latches, timers, counters, sequencers) will be reset to their initial states.

Editing EEPROM Programs

You cannot edit the EEPROM program directly. You must first load the program into the processor RAM, if it is not already in the RAM. You then edit the RAM program and store the edited program in the EEPROM.

For example, suppose an EEPROM is installed, and its contents are loaded in the RAM. You can change the program in the EEPROM as follows:

1. The RAM program is a duplicate of the EEPROM program; edit the RAM program.
2. Press MODE, 6, ENTER, ENTER.
3. The edited program is now in the EEPROM (and in the RAM).

Changes not Saved in EEPROM (Error Code E52)

Error code E52 tells you that the processor RAM program does not match the EEPROM program. If an EEPROM is installed in the processor unit, this error will appear after you edit your program and attempt to enter the Run or Test modes. This reminds you that you should load the edited program in the EEPROM before going into the Run mode.

Error code E52 can be overridden by pressing ENTER again. Note: Error code E52 is not displayed when on-line data changes are made to the processor RAM.

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